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For: METHOD AND APPARATUS FOR READING IMAGES USING
CORRECTION CONDITIONS TO PROCESS FINE SCAN DATA

LETTER

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

July 17, 2003

Sir:

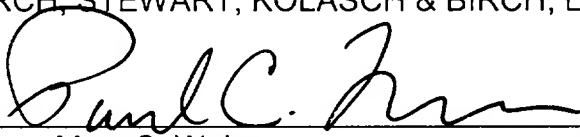
Attached hereto for the Examiner's consideration is a Japanese Patent Office website computer-generated translation of Okamoto, Japanese Patent Publication No. 09-065155. This document is currently of record and was relied on by the Examiner in the Office Action dated April 11, 2003. Consideration of this translation by the Examiner is requested.

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Respectfully submitted,

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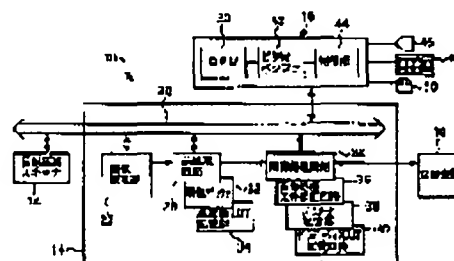
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(54) PICTURE PROCESSOR

(57)Abstract:

PROBLEM TO BE SOLVED: To stably prepare pictures whose highlights are beautiful by selecting a mode for deciding picture processing conditions only from the picture information of an indication point or the mode for deciding the picture processing conditions by using the other picture information than the indication point when the indication point of highlight finish information is set.

SOLUTION: In the case of selecting the highlight as a finish instruction in a system 10, the presence/absence of the setting of the indication point are selected first by a mouse 50 or the like. When the instruction point is set, further, the mode A for deciding the picture processing conditions from the picture information of the indication point and the picture information obtained by pre-scanning or the mode B for deciding the picture processing conditions only from the picture information of the indication point is selected. Thus, the picture processing conditions are set by using the optimum picture information corresponding to the technique of an operator and the pictures, high quality pictures are obtained even by an unexperienced operator and the high quality pictures whose highlights are more beautiful are be obtained when the operator is fully experienced.



* NOTICES *

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1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. *** shows the word which can not be translated.
3. In the drawings, any words are not translated.

CLAIMS

[Claim(s)]

[Claim 1] The image processing system which performs and outputs the image processing according to the image-processing conditions set as the image information obtained by reading in photoelectricity the manuscript picture characterized by providing the following according to directions of workmanship information. A display means to display the aforementioned manuscript picture. A directions means to direct the highlight workmanship information on the output picture acquired from the aforementioned image information. A directing point setting means to set up the position which should direct the workmanship information by the aforementioned directions means in the picture displayed on the aforementioned display means. A means choose either the mode in which image-processing conditions are determined as a means to choose the important point and needlessness of a directing point setup by the aforementioned directing point setting means at the time of directing the aforementioned highlight workmanship information, only from the image information of a directing point when the aforementioned directing point is set up, or the mode in which also use image information other than a directing point, and image-processing conditions are determined.

[Translation done.]

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[The technical field to which invention belongs] this invention relates to the image processing system for processing the image information read in photoelectricity and acquiring a desired output picture. It is related with the image processing system which enables the output of the beautiful picture of a highlight detailed especially.

[0002]

[Description of the Prior Art] for example, in the field of printing and platemaking, the image information which read the manuscript picture in photoelectricity and read it for the purpose of rationalization of a routing, improvement in picture quality, etc. is processed electrically, according to the processed image information, scanning exposure of the film sensitive material is carried out, and a film issue is created -- the picture reading regeneration system is used extensively

[0003] Such a picture reading regeneration system consists of a reader which reads a manuscript picture in photoelectricity, an image processing system which processes image information, and a recording device which outputs a picture fundamentally. Among these, the press can which reads the manuscript picture performed before reading for image recording to ** (rough) in an image processing system is performed. The workmanship information on a set up reading conditions, such as scale-factor and trimming range, and corresponding to pattern etc. output-by directions means picture, For example, "highlight is beautifully pointed to the workmanship information on output pictures, such as ", "the beautiful skin", "a beautiful sky", and "beautiful green." After setting up image-processing conditions, reading for acquiring an output picture, i.e., this scan, is performed (refer to each official report of JP,4-111575,A and 6-291998).

[0004] That is, in the picture reading regeneration system, the image information obtained with this scan according to the image-processing conditions which performed this scan and were previously set up after having performed the press can, being finished with the image information (picture weighted solidity) obtained by the press can and setting up image-processing conditions from informational directions was processed first, film sensitive material was exposed according to the processed image information, and the output picture has been acquired.

[0005]

[Problem(s) to be Solved by the Invention] By the way, a highlight (the maximum bright section) is mentioned as one of the factors which is not based on a pattern but has big influence on the quality of image of an output picture. Especially, in the case of printed matter, in order to acquire a high definition picture, a highlight is very important in many cases. As mentioned above, an image processing system has a means to direct the workmanship information on an output picture, and the highlight result information for finishing a highlight beautifully is usually included in this.

[0006] In the conventional image processing system, when highlight result information is directed (it is usually the same also at the other directions), as the art, two operating instructions are selectable.

[0007] One is the way an operator sets up specification, i.e., a specifying point, for the place of the highlight in a picture. In the usual picture reading regeneration system, if a press can is performed, the picture read by the display of CRT etc. will be displayed. An operator looks at this picture, chooses which portion in a picture is a highlight, and specifies it with a mouse etc. In this case, a setup of image-processing conditions is performed using the image information of a specifying point, and the data of the concentration distribution obtained by the press can. Another side is the method of not setting up a specifying point, equipment distinguishes a highlight field from the image information obtained by the press can in this case, and the image-processing conditions about a highlight are set up using the image information of the distinguished highlight field, and the data of the concentration distribution obtained by the press can. That is, it is the method of making it possible to acquire a picture also with the good

operator with little experience who cannot judge correctly where the method of not setting up a specifying point carries out a highlight, and the method of setting up another side and a specifying point is the method of enabling adjustment for the operator who has a certain amount of experience acquiring a high definition picture.

[0008] Here, even if it is the time of an operator mistaking and specifying a highlight the image information obtained by not only the image information of a specifying point but the press can, and by also more specifically referring to a concentration distribution (gray level histogram), and setting up image-processing conditions, it consists of methods of setting up a specifying point so that a setup of good image-processing conditions may be possible. However, image information, such as picture defects, such as dust adhering to the manuscript and a white omission which the manuscript has, is also contained in the gray level histogram obtained by the press can. Therefore, with conventional equipment, when an operator specifies a highlight correctly, the image information obtained by the press can may have a bad influence on image-processing conditions conversely.

[0009] The purpose of this invention is to solve the trouble of the aforementioned conventional technology, can choose directions of the workmanship information about a highlight according to a picture, an operator's skill, etc., and is to offer the image processing system which makes it possible to be stabilized and to create the beautiful picture of a highlight.

[0010]

[Means for Solving the Problem] In order to attain the aforementioned purpose, this invention to the image information obtained by reading a manuscript picture in photoelectricity A display means to be the image processing system which performs and outputs the image processing according to the image-processing conditions set up according to directions of workmanship information, and to display the aforementioned manuscript picture. In the picture displayed on a directions means to direct the highlight workmanship information on the output picture acquired from the aforementioned image information, and the aforementioned display means A directing point setting means to set up the position which should direct the workmanship information by the aforementioned directions means, When the means and the aforementioned directing point which choose the important point and needlessness of a directing point setup by the aforementioned directing point setting means at the time of directing the aforementioned highlight workmanship information are set up The image processing system characterized by having a means to choose either the mode in which image-processing conditions are determined only from the image information of a directing point, or the mode in which also use image information other than a directing point, and image-processing conditions are determined is offered.

[0011]

[Function of the Invention] The image processing system of this invention is equipment which sets the processing conditions of image information automatically from directions of the workmanship information directed according to the output picture made into the image information (picture weighted solidity) and the purpose which were gained by the press can (auto setup). When the method of setting up a directing point like before, and the method which is not set up set up a directing point about directions of highlight result information in addition to selectable composition It has selectable composition for the mode in which image-processing conditions are set up from the image information obtained from the image information of only a directing point by the mode in which image-processing conditions are set up, and the image information and the press can of a directing point as usual.

[0012] Therefore, according to the image processing system of this invention, according to an operator's skill and picture, image-processing conditions can be set up using the optimal image information (for example, when a highlight is clear etc.), and even if it is the shallow operator of experience, if it is the operator who has the abundant high skill of experience, a high definition picture with a more beautiful highlight can be acquired possible [acquiring a high definition picture].

[0013]

[Embodiments of the Invention] Hereafter, it is attached to the image processing system of this

invention, and the suitable example shown in an attached drawing is explained to origin in detail. Drawing 1 is the configuration block view of the picture reading regeneration system using the image processing system of this invention. This picture reading regeneration system 10 (it considers as a system 10 hereafter) Carry out the spectrum of the picture supported by the transparency manuscript or the reflection copy to the three primary colors of R (red), G (green), and B (blue), and it is read in photoelectricity. The image processing of this is carried out by making the acquired electrical signal into a picture signal, film sensitive material is exposed according to the obtained image information, and they are the C (cyanogen) version, the M (Magenta) version, the Y (yellow) version, or the thing that forms and outputs the film issue of three sheets or four sheets of the Japanese ink (K) version further.

[0014] While this system 10 reads fundamentally the picture of the reflection copy scanner 12 which reads the picture of reflection copies, such as printed matter and a photograph, in photoelectricity, and transparency manuscripts, such as a reversal film, in photoelectricity While operating the transparency manuscript scanner 14 which makes a picture signal the electrical signal acquired by control of the reflection copy scanner 12 and the row, and performs and outputs a predetermined image processing, and transparency manuscript scanner 14 grade It consists of a workstation 16 which displays the picture (press can picture) read with the transparency manuscript scanner 14, and a recording device 18 which carries out scanning exposure of the film sensitive material, and outputs a film issue according to the image information outputted from the transparency manuscript scanner 14.

[0015] The light source and this which the reflection copy scanner 12 is a well-known picture reader which reads the picture of a reflection copy in photoelectricity, for example, extend in ** on the other hand, and the slit which extends in this direction, By scanning a reflection copy relatively [direction / which intersects perpendicularly / the extension direction of a slit, and], the reflected light which supports the picture of a manuscript is obtained, and image formation of this is carried out to line sensors, such as a CCD sensor corresponding to each of R, G, and B, and it reads in photoelectricity, and outputs to the transparency manuscript scanner 14.

[0016] The transparency manuscript scanner 14 has the picture read station 22, the pretreatment circuit 26, and the image-processing circuit 28. Moreover, the aforementioned reflection copy scanner 12 is mutually connected to these rows by bus 30.

[0017] The picture read station 22 is a well-known picture reader which reads the picture of a transparency manuscript in photoelectricity by slit scanning or field exposure, for example, obtains the transmitted light which supports the picture of a transparency manuscript by the same slit scanning as the previous reflection copy scanner 12, and it carries out image formation to line sensors, such as a CCD sensor corresponding to each of R, G, and B, and is read to them, and it outputs it to them.

[0018] The pretreatment circuit 26 performs pretreatment before performing an image processing to the image information outputted from the reflection copy scanner 12 or the picture read station 22. The picture buffer 32 which records image information on this pretreatment circuit 26 temporarily, and color conversion LUT for performing predetermined color conversion The storage section 34 is connected.

[0019] The image-processing circuit 28 performs a predetermined image processing according to the image-processing conditions set up beforehand, and outputs it to a recording device 18 as output image information. The image-processing condition correction circuit 36 which amends image-processing conditions (image-processing conditioning = auto setup) is connected to this image-processing circuit 28. furthermore, in this image-processing condition correction circuit 36 The parameter storage section 38 which memorizes the setup parameter used as image-processing conditions, the gradation curve (tone curve) used as the criteria of gradation processing, the network % data of an ideal according to directions of workmanship information, etc. are made into a look-up table. Gradation LUT to memorize The storage section 40 is connected.

[0020] A workstation 16 is further connected to the above-mentioned bus 30. A workstation 16 has CPU20, the video buffer 42, and control section 44 which control the whole, and this control section 44 processes the input data of a keyboard 48 and a mouse 50 while performing the

output control to the display 46 connected to the workstation 16. In this workstation 16, directions of workmanship information, a scale factor, a setup of the trimming range, etc. are performed.

[0021] the light beam which a recording device 18 is a printer which uses light beam scanning exposure, for example, was modulated according to the image information from the image-processing circuit 28 -- film sensitive material -- scanning exposure -- carrying out -- a development -- carrying out -- as an output picture -- C, M, and Y -- or each film issue of K is outputted further

[0022] Although a system 10 has the above-mentioned composition fundamentally, it shows the flow of the film-issue creation by this system 10 to drawing 2. First, if a manuscript is set to the predetermined position of the picture read station 22 (reflection copy scanner 12), the press can which reads the picture of a manuscript to ** (rough) will be performed. While predetermined processing of logarithmic transformation etc. is performed to the image information of the manuscript read by the press can by the pretreatment circuit 26 and it is memorized at the picture buffer 32, it is sent to a workstation 16 and the picture is displayed on a display 46. An operator directs workmanship information while he looks at this display 46 and sets up required reading (output) conditions, such as a scale factor and a trimming range, using a keyboard 48 and a mouse 50. An end of these operations performs a setup of image-processing conditions in the image-processing condition amendment circuit 36 according to directions of the image information obtained by the press can and workmanship information. In addition, directions of workmanship information and a setup of image-processing conditions are explained in full detail behind.

[0023] If image-processing conditions are set up, picture reading (this scan) for forming a film issue will be performed, the image processing according to the image-processing conditions previously set as the obtained image information will be performed by the image-processing circuit 28, and a picture (film issue) will be outputted by the recording device 18.

[0024] The flow from this scan of this to a picture output is shown in drawing 3. If this scanning start is directed, slit scanning of a manuscript will be performed in the picture read station 22 (reflection copy scanner 12), and a spectrum is carried out to the three primary colors of R, G, and B, and by the CCD sensor etc., photo electric translation of the transmitted light (or reflected light) which supports a manuscript picture will be read and carried out, it will be outputted as image information, and will be sent to the pretreatment circuit 26, respectively. In the pretreatment circuit 26, under an operation of CPU20, predetermined processing of A/D conversion, logarithmic transformation, etc. is performed, concentration conversion is performed, the image information of the concentration of C, M, and Y is generated, and it is once accumulated at the picture buffer 32. Subsequently, in the pretreatment circuit 26, it is the color conversion LUT. Based on the color conversion look-up table which is memorized by the storage section 34 and which was set up according to the depth of shade of a picture, predetermined color transform processing is performed to the previous image information of C, M, and Y, and it considers as the image information of C, M, and Y concentration.

[0025] Subsequently to the image-processing circuit 28, this image information is sent. The image-processing conditions which were previously finished with the press can and were set up from informational directions in the image-processing circuit 28 are accepted. Picture adjustment processing in which the highlight concentration and shadow concentration of image information of C, M, and Y are adjusted to the reference value set up beforehand is performed. After processing of gradation processing, color collection processing, UCR (bottom color removal of Under Color Removal=), sharpness emphasis, etc. is furthermore performed and considering as the image information of network % data, it is outputted to a recording device 18.

[0026] In a recording device 18, a light beam is modulated according to the image information of the network % data outputted from the image-processing circuit 28, scanning exposure of the film sensitive material is carried out, the so-called half-tone-dot-meshing processing which forms a half-tone-dot picture is performed, subsequently a development is given, and the film issue in which the half-tone-dot picture was formed is outputted.

[0027] Subsequently, directions of the workmanship information previously touched on the

occasion of explanation of the film-issue creation using the flow chart of drawing 2 and a setup of image-processing conditions are explained. As mentioned above, image-processing conditions are set up from directions of the image information of the manuscript picture acquired by the press can, and workmanship information. While the almost same processing as the image information of this scan is performed in the pretreatment circuit 26, the image information of the manuscript picture acquired by the press can is stored in the picture buffer 32 and picture weighted solidity is calculated, a picture is displayed on a display 46. As picture weighted solidity, average concentration, the maximum concentration, etc. of every the average concentration, the maximum concentration and the minimum concentration for the number of pixels, the whole, or every field that carried out screen separation (for example, 1/2, 1 / 4 grades), C and M, and Y (or R, G, and B) in the arbitrary concentration of the gray level histogram obtained by the press can are illustrated, and one or more is used.

[0028] In order are parallel to calculation of this picture weighted solidity and to create the film issue according to the purpose, it is finished by the operator and informational directions are performed (namely, in order to obtain predetermined printed matter), from these both (it is finished with picture weighted solidity and they are informational directions), image-processing conditions are set up and the above-mentioned gradation processing, color collection processing, UCR, sharpness emphasis, etc. are performed according to this image-processing condition. In addition, directions of workmanship information do not necessarily need to be performed and image-processing conditions are set up only from picture weighted solidity in that case.

[0029] If a press can is performed, as shown in drawing 4, workmanship information will be displayed on a display 46 with a manuscript picture. Workmanship information was finished for example, with luminosity directions, has separated to directions, and is set to the equipment of the example of illustration. " and five items of workmanship information "as a manuscript" are displayed a little darkly, luminosity directions -- " -- bright -- " and " -- a little -- bright -- " and " -- dark -- " and " -- Any one can be directed, on the other hand by workmanship directions, "A:skin and a gray", "B: Five items of highlight", "C:shadow", "D:sky", and "E:green" are displayed, one or more can be directed, and an operator directs this with a mouse 50 or a keyboard 48 according to a pattern. Furthermore, by choosing "a directing point setup", and setting up one point or two or more directing points by mouse 50 grade if needed, which position (field) can be made beautiful, or (is it finished and lets where be the criteria of directions) it can direct.

[0030] the system 10 of the example of illustration -- setting -- each workmanship directions -- corresponding -- various kinds of concentration -- each color (the skin --) the network % data (C --) of the ideal corresponding to a gray, empty, green, a highlight, and the color balance of C, M, and Y for carrying out shadow realization the curve of M and Y space, and a row -- a highlight and the network % balance (C --) of the ideal of a shadow One point of M and Y space is Gradation LUT. As opposed to the workmanship information the network % data of the film issue which the storage section 40 memorizes and is outputted were instructed to be Image-processing conditions are set up so that C, M, and Y may become network % data of the ideal arranged with a highlight / shadow balance at the predetermined color balance row. Here, in the system 10 using the image processing system of this invention, the workmanship directions in "A:skin and a gray", "C:shadow", "D:sky", and "E:green" and a setup of image-processing conditions are the same as usual, and are performed by the well-known method indicated by each official report of above-mentioned JP,4-111575,A and 6-291998. On the other hand, workmanship directions of "B:highlight" and a setup of image-processing conditions are performed as follows.

[0031] In the system 10 using the image processing system of this invention, when "B:highlight" is chosen as workmanship directions, the existence of a setup of a directing point is first chosen by mouse 50 grade (other items of this point are together), and when a directing point is set up, as shown in drawing 4, A mode or an B mode is chosen further. Here, A mode is the mode in which image-processing conditions are set up from the image information obtained by the image information and the press can of a directing point, and an B mode is the mode in which image-processing conditions are set up only from the image information of a directing point.

[0032] First, when a directing point is not set up, image-processing conditions are set up by the same method as usual of a highlight field being detected from the image information of a press can, determining highlight concentration from the concentration of this field, and the image information of a press can, and setting up image-processing conditions. More, first, in a detail, the low concentration fields in a picture (for example, 0.4 or less concentration etc.) are searched from the image information of a press can, among those, if possible, near and a field detect a latus portion in it focusing on a picture. furthermore, the portion concentration is not much alike and is [portion] below a low predetermined value out of the detected field -- a picture -- base -- since it may be an omission (base density), it deletes and considers as a highlight field. In addition, limitation is not carried out to this method, but the various use of the method of detection of a highlight field is possible for a well-known method. Thus, a highlight field is detected and highlight concentration is determined using the concentration. The method of setting the minimum concentration (the minimum data of a gray level histogram) of c and press can image information to b, and computing the concentration of the aforementioned highlight field by the following formula as an example, as the determination method of highlight concentration, is illustrated.

By $c \times W_a + b \times W_b =$ highlight concentration, in addition the above-mentioned formula, W_a is probability with a highlight, and W_b is probability without a highlight and is " $W_a + W_b = 1$." Thus, highlight concentration is determined. In addition, the above-mentioned picture weighted solidity serves as a parameter which computes the initial value of image-processing conditioning. This point is explained by JP,6-291998,A in full detail.

[0033] On the other hand, "a directing point setup" is chosen, and when one point or two or more directing points which should be considered as a highlight by mouse 50 grade are set up, A mode or an B mode is chosen as mentioned above. When A mode is chosen, image-processing conditions are set up by the same method as usual of determining highlight concentration from the image information of a directing point, and the image information of a press can, and setting up image-processing conditions. The following method is illustrated as an example. First, the average of the picture concentration of a directing point is computed and it is the directing point concentration a_1 about this. It carries out. This directing point concentration a_1 Initial highlight concentration is computed by the following formula using the minimum concentration b of the above-mentioned press can image information.

The initial highlight concentration of $a_1 \times W_a + b \times W_b =$, thus initial highlight concentration are determined. Thus, the determined initial highlight concentration is used for an initial setup parameter, and each half-tone-dot data is calculated from the concentration data of C, M, and Y of a directing point (S1).

[0034] On the other hand, the image-processing condition correction circuit 36 is Gradation LUT about the network % data of the ideal beautifully corresponding to " for directed "highlight. It reads from the storage section 40 and the point on the network % data of the ideal near the network % data of a directing point, i.e., target network % data, is calculated (S2). Here, beautifully, it is common in " in "highlight, is beautifully common in " in "shadow "arranged with a gray", and corresponding network % data are defined as data on the curve beta which connects the point h1 of drawing 5 - h. namely, the network % data corresponding to each concentration of C, M, and Y of the i-th directing point -- respectively -- c_i and m_i And y_i Index r_i shown by the following formula (1) when the points on the network % data of the ideal near this are (c_j , m_j , and y_j) Network % data which serve as the minimum are target network % data, therefore they are c_j and m_j . And y_j serves as target network % data.

$$r_i^2 = 2(c_i - c_j) + (m_i - m_j)^2 + 2(y_i - y_j) \dots (1)$$

c_i , m_i , y_i : The network % data c_j of the i-th directing point, m_j , y_j : Ideal network % data [0035] Such operation (S1-S2) is performed to each directing point, the network % data of a directing point and target network % data which were obtained are averaged, respectively, and it asks for the network % data of the directing point that every C, M, and Y were equalized, and target network % data. Subsequently, the correction which performs size comparison of both network % data, for example, carries out constant-rate reduction of the highlight concentration of Y when the average of the network % data of Y of a directing point is smaller than the average of target

network % data, and increases in being reverse is made. That is, a setup parameter is corrected. Same operation is performed also to C and M, and the corrected setup parameter is memorized in the parameter storage section 38 (S3).

[0036] Subsequently, the network % data of a directing point are again calculated like the above S1 using the corrected setup parameter (S4).

[0037] The network % data obtained using the setup parameter which the image-processing condition correction circuit 36 continued, and was corrected are evaluated (S5). namely, — for example, the performance index which shows whether the network % data of Y of the directing point before changing highlight concentration are how much [target network % data and] separated as a whole if it is $Y - f_y$ — if it carries out and the same performance index after changing highlight concentration is set to f_{ya} , each performance index will become as shown in the following formula (2) and (3)

[0038]

[Equation 1]

$$f_y = \sum_{i=1}^n r_{iy}$$

$$= \sum_{i=1}^n W_i \cdot \sqrt{(y_i - y_{i0})^2} \quad \dots (2)$$

$$f_{ya} = \sum_{i=1}^n r_{iya}$$

$$= \sum_{i=1}^n W_i \cdot \sqrt{(y_{ia} - y_{i0})^2} \quad \dots (3)$$

In the above-mentioned formula n : The number y_i of directing points : Network % data y_{i0} of y before the i-th highlight concentration correction of a directing point : Target network % data y_{ia} of Y of the i-th directing point : Weighting coefficient y_{ia} of the i-th directing point : The network % data r_{iy} of y after the i-th highlight concentration correction of a directing point Index r_{iya} of y before highlight concentration correction of a i position directing point : Index of y after the i-th highlight concentration correction of a directing point [0039] In addition, in the above-mentioned formula, when the hues of the supporting point set up by the operator differ, the weighting coefficient w is for correcting the deflection, and it is set automatically so that this deflection may be lost.

[0040] Subsequently, performance index f_y acquired by the above-mentioned formula (2) and (3) And f_{ya} is compared and network % is evaluated. If it is $f_y > f_{ya}$, since the network % data of Y of a directing point are approaching target network % data here Judge with correction of highlight concentration being just, newly memorize this setup parameter in the parameter storage section 38, operate S3-S5, and conversely, if it is $f_y < f_{ya}$ Since the network % data of Y of a directing point are separated from target network % data, it judges with correction of highlight concentration having been too large, the amount of corrections is changed into one half, and S3-S5 are operated.

[0041] Similarly, it is the aforementioned performance index f_y also about M and C. And a judgment and correction of highlight concentration are made using the same method as f_{ya} . When it carries out by having repeated the transfer method of highlight concentration from such S3 to S5 and all of C, M, and Y become target network % data, a setup of the setup parameter to highlight concentration is ended.

[0042] On the other hand, when an B mode is chosen, image-processing conditions are determined as follows, using only the image information of a directing point. First, what has the minimum concentration among the set-up directing points is detected, and it is the directing point concentration a_2 about the concentration of this point. It carries out, the network %

balance (G --) of the ideal beautifully corresponding to [using directing point concentration a2 as initial highlight concentration in this method] " for "highlight It is Gradation LUT about one point of M and Y space, and the network % data of an ideal. It reads from the storage section 40. The low portion of concentration is most considered as the network % balance of the aforementioned ideal among specifying points, and specifying points other than this determine image-processing conditions as mentioned above so that a specifying point may serve as network % data of this ideal for the purpose of the network % data of an ideal.

[0043] The image-processing conditions which choose the directions method of highlight workmanship information and make a highlight beautiful by using the image processing system of such this invention according to an operator's skill and picture can be set up, and if it is the operator who has the abundant high skill of experience possible [acquiring the beautiful high definition picture of a highlight] even if it is the shallow operator of experience, a high definition picture with a more beautiful highlight can be acquired. That is, since equipment detects a highlight field and sets up image-processing conditions even if it is the case where the operator who cannot detect a highlight correctly by choosing the mode in which a directing point is not set up and who is completely inexperienced operates it, the beautiful high definition picture of a highlight can be acquired, and since it is not necessary to set up a specifying point, work is also very simple and still easier. Moreover, since this can be compensated and picture conditions can be set up by the image information of a press can even if an operator is mistaken in it and sets up a highlight by choosing A mode, when detection of the shallow operator of experience or a highlight is difficult, the beautiful high definition picture of a highlight can be acquired. Furthermore, since dust can adhere to a manuscript the skilled operator who can set up a highlight correctly, and by choosing an B mode when a highlight is a clear picture, or the bad influence by this is eliminated entirely and image-processing conditions can be set up even if it is the case where a picture has a nest omission, a high definition picture with a more beautiful highlight can be acquired. In addition, in the image processing system of this invention, it is as above-mentioned that result directions are selectable in plurality, in that case, the network % data of the ideal corresponding to other result directions also consider, and image-processing conditions are set up.

[0044] Thus, after setting up image-processing conditions (setup parameter), as this scan is performed as shown in drawing 2 , and shown in drawing 3 , by performing gradation processing, color collection processing, etc. according to the set-up image-processing conditions, it is stabilized and the high definition output picture according to directions of workmanship information and the beautiful picture of a highlight can be formed especially.

[0045] As mentioned above, although the image processing system of this invention was explained in detail, this invention of various kinds of improvement and change being made is natural in the range which limitation is not carried out to the above-mentioned example, and does not deviate from the summary of this invention.

[0046]

[Effect of the Invention] As mentioned above, if it is the operator who according to the image processing system of this invention could choose directions of the workmanship information about a highlight according to a picture, an operator's skill, etc., was stabilized, and could create the beautiful picture of a highlight easily, and became skillful as explained in detail, by mode selection, the bad influence of the image information obtained by the press can be eliminated entirely, and a high definition picture with a very beautiful highlight can be acquired.

[Translation done.]

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the configuration block view of the picture reading regeneration system using the image processing system of this invention.

[Drawing 2] It is a flow chart for explaining an operation of the picture reading regeneration system shown in drawing 1.

[Drawing 3] It is a flow chart for explaining image information processing in the picture reading regeneration system shown in drawing 1.

[Drawing 4] It is the conceptual diagram showing an example of the display display in the picture reading regeneration system shown in drawing 1.

[Drawing 5] It is the graph which shows an example [highlight / workmanship directions "] / of the network % " data of the ideal beautifully corresponding to " for "shadow "arranged with a gray."

[Description of Notations]

10 (Picture Reading Reproduction) System

12 Reflection Copy Scanner

14 Transparency Manuscript Scanner

16 Workstation

18 Recording Device

20 CPU

22 Picture Read Station

26 Pretreatment Circuit

28 Image-Processing Circuit

30 Bus

32 Picture Buffer

34 Color Conversion LUT Storage Section

36 Image-Processing Condition Correction Circuit

38 Parameter Storage Section

40 Gradation LUT Store Circuit

42 Video Buffer

44 Control Section

46 Display

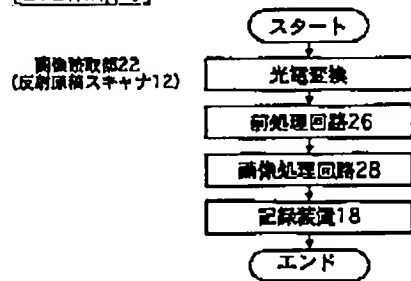
48 Keyboard

50 Mouse

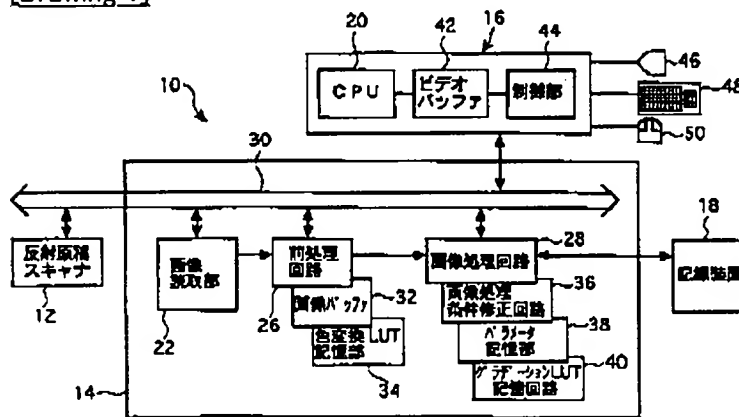
[Translation done.]

DRAWINGS

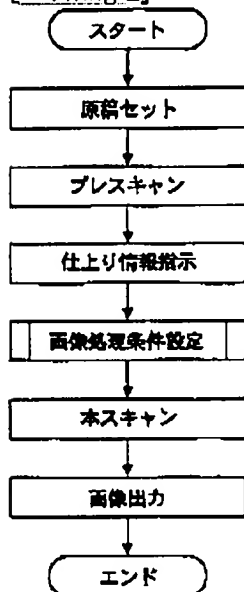
[Drawing 3]



[Drawing 1]

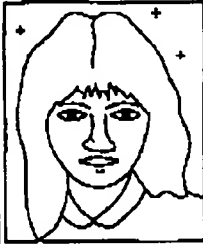


[Drawing 2]



[Drawing 4]

仕上がり情報



明るさ指示

明るく	やや明るく
暗く	やや暗く
原稿通り	

仕上がり指示

A: 肌・グレー
☐ グレーに合わせる ☐ 指定点 設定

B: ハイライト
☐ 弱しく ☐ 指定点 設定

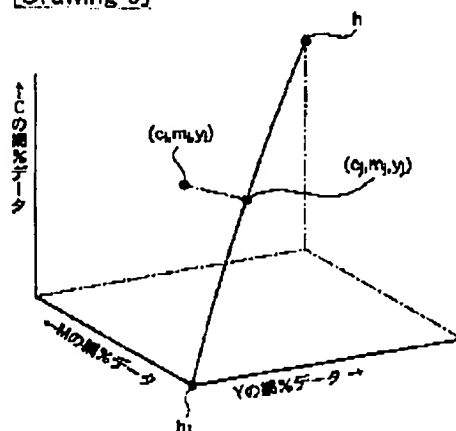
C: シャドウ
☐ やや弱しく ☐ 指定点 設定

D: 空
☐ 黄しい強1 ☐ 指定点 設定

E: 雲
☐ 黄しい強1 ☐ 指定点 設定

+は指定点

[Drawing 5]



[Translation done.]